Geol Survey

a guide to the geology of the Crystal Lake — Richmond area

David L. Reinertsen

Field Trip 1983 B
May 14, 1983

Illinois Department of Energy and Natural Resources
STATE GEOLOGICAL SURVEY DIVISION
Champaign, Illinois

Miles to next point	Miles to starting point	
		Line up in the parking lot south of the Nature Center at Veterans Acres. Park on the north side of Crystal Lake (West side of Main Street; one block north of Illinois Route [SR] 176). The mileage figures begin at the south end of the circle drive at the Nature Center.
		STOP 1. DISCUSSION OF THE PARK'S GLACIAL FEATURES (SE 1/4 NE 1/4 SE 1/4 NE 1/4 Sec. 32, T. 44 N., R. 8 E., 3rd P.M.; McHenry 7.5-minute Quadrangle).
0.0	0.0	Leave Stop 1. TURN RIGHT (south) on Main Street.
0.15	0.15	STOP: Terra Cotta Avenue (SR 176). TURN LEFT (east).
0.35	0.5	CAUTION: Single guarded railroad crossing. CONTINUE AHEAD (east).
0.6	1.1	Notice the very rolling topography on either side of the road at this point: the Cary end moraine to the left and the slightly lower West Chicago end moraine to the right.
0.55	1.65	CAUTION: stop light at the five-points intersection. TURN RIGHT (south) on SR 31.
0.5	2.15	CAUTION: stoplight; Crystal Lake Avenue. CONTINUE AHEAD (south) on SR 31.
0.75	2.9	Approach to traffic interchange with U.S. Route (US) 14. PREPARE to go east to Cary on US 14. Cross west end of a large kame.
0.4	3.3	CAUTION: sharp RIGHT TURN after going under the US 14 overpass.
0.1	3.4	STOP (1-way): US 14. TURN RIGHT (easterly).

Miles to next point	Miles to starting point	
0.3	3.7	Highway narrows; MERGE LEFT.
1.25	4.95	CAUTION: stoplight. BEAR LEFT (east) on Three Oaks Road.
0.1	5.05	CAUTION: enter city of Cary.
0.1	5.15	To the right note the very pronounced swell and swale topography on the backslope of the West Chicago Moraine here. A small amount of shallow plowing plus frost-heave bring cobbles and boulders to the surface very easily through the relatively thin soils.
0.4+	5.55+	STOP (4-way): TURN RIGHT (southerly) on Silver Lakes Road.
0.25-	5.8	STOP: irregular crossroad. BEAR RIGHT (southerly) on Cary-Algonquin Road.
0.1+	5.9+	CAUTION: cross overpass over US 14; immediately beyond is a guarded (C&NW) railroad grade crossing--two tracks. CONTINUE AHEAD (south).
0.2-	6.1	To the right note the swell and swale topography on the backslope of the West Chicago Moraine.
0.3	6.4	STOP (4-way): Main Street. CONTINUE AHEAD (south) on Cary-Algonquin Road.
1.0	7.4	The field to the right contains many areas that are very stony.
0.45	7.85	TURN LEFT (west) on Klasen Road.
0.15	8.0	To the left is a good view of the Meyer Materials Company, Algonquin Sand and Gravel Pit. Along the road and on the outside of the berm separating the road from the pit, note the variety of large boulders (glacial erratics) that have come out of this pit. Material is moved by conveyor belt to the Meyer Materials Company plant, west of SR 31.
0.4+	8.4+	View ahead (west) down, off the West Chicago Moraine.
0.25	8.65+	STOP (1-way): T-road intersection. CAUTION—fast traffic. TURN LEFT (south) on SR 31 and get on the right shoulder immediately.

Miles to next point	Miles to starting point	
0.15-	8.8	Park near the ramp and gate to the west that is a former entrance to the Materials Service Corporation Algonquin Sand and Gravel Pit. Do NOT go beyond the fence and gate.
		STOP 2. VIEW FROM THE GATE TO THE WEST ACROSS THE OUTWASH PLAIN JUST BEYOND THE FRONT OF THE WEST CHICAGO END MORAINE, SHOWING AREA OF MULTIPLE LAND USE: PRAIRIE/FARM LAND/GRAVEL PIT/FARM LAND. (NE 1/4 SE 1/4 NE 1/4 SW 1/4 Sec. 22, T. 43 N., R. 8 E., 3rd P.M.; Crystal Lake 7.5-minute Quadrangle).
0.0	8.8	Leave STOP 2. CONTINUE AHEAD (south) on SR 31.
0.2-	9.0-	To the right is the entrance to the Materials Service Company operating pit and processing plant.
0.2	9.2-	The conveyor belt from the Meyer Materials Company pit along Klasen Road passes beneath SR 31 here. CONTINUE AHEAD (south).
0.5	9.7-	CAUTION: enter town of Algonquin and prepare to descend steep hill into the town.
0.4+	10.1	To the left is the Fox River.
0.25+	10.35	CAUTION: Stoplight. TURN RIGHT (west) toward Lake-in-the-Hills.
0.55-	10.9	Railroad overpass. CONTINUE AHEAD (westerly).
0.35	11.25	CAUTION: Enter Lake-in-the-Hills.
0.05	11.3	CAUTION: TURN RIGHT (northerly) on Pyott Road at T-road intersection on the curve.
0.3	11.6	CAUTION: Pull off and park on the narrow east shoulder of Pyott Road, opposite the concrete silo. Shoulder is soft when wet so beware of ditch. FAST TRAFFIC, SO WALK IN DITCH.
		STOP 3. WEST CHICAGO OUTWASH GRAVEL OVER TISKILWA TILL EXPOSED IN ROAD CUT. (SE 1/4 NE 1/4 NW 1/4 Sec. 28, T. 43 N., R. 8 E., 3rd P.M.; Crystal Lake 7.5-minute Quadrangle).
0.0	11.6	Leave STOP 3 and CONTINUE AHEAD (northerly).

Miles to next point	Miles to starting point	
0.5	12.2	The area to the left is an abandoned sand and gravel pit that has been developed for recreational purposes. To the east is the Larsen Industrial Park, part of an abandoned sand and gravel pit. Much of the considerable amount of material removed from these pits is used for construction in Chicago.
1.45	13.55	Lake-in-the-Hills airport to the left; continue ahead north.
0.65+	14.2+	STOP (2-way): crossroad, Virginia Road. CONTINUE AHEAD (northerly); Pyott Road becomes East Gate Road.
0.2-	14.4-	STOP (3-way): TURN RIGHT (east) on Three Oaks Road and immediately cross two-guarded tracks on the C&NW Railroad.
0.2+	14.6	To the left is part of the abandoned area of the Vulcan Materials Company sand and gravel pit.
0.1	14.7	This company's present operation is to the right of the south side of Three Oaks Road. Drag lines remove sand and gravel from below the water level and conveyor belts carry it to their screening (sieving) operations. CONTINUE AHEAD (east).
0.7	15.4	STOP (4-way). TURN LEFT (north) on Pingree Road. After turning left you can catch a glimpse of the eastern portion of the abandoned area of the Vulcan Materials pit.
0.5	15.9	CAUTION: stoplight. TURN RIGHT (east) on US 14.
0.3	16.2	CAUTION: approach interchange with SR 31; cross over SR 31 for turn toward McHenry, north on SR 31.
0.2	16.4	CAUTION: <u>sharp</u> RIGHT TURN.
0.1-	16.5-	STOP (1-way): BEAR RIGHT onto SR 31 (north).
0.1+	16.6	CAUTION: traffic merges from right. CONTINUE AHEAD (north) on the four lanes.
1.05-	17.65-	CAUTION: Stoplight; Crystal Lake Avenue. continue ahead (north).

Miles to next point	Miles to starting point	
0.5	18.15-	CAUTION: Stoplight; Terra Cotta Avenue (SR 176). BEAR HALF RIGHT (northeast) onto SR 176.
0.45+	18.6	Good view from the Cary Moraine to the right (south) across the outwash plain.
0.5	19.1	CONTINUE AHEAD and CURVE RIGHT (easterly) on SR 176 at Barreville Road.
0.4	19.5	CAUTION: enter Prairie Grove.
1.55-	21.05-	To the left is a Road Materials Company gravel pit. Note the collection of large boulders from the Cary Moraine at the entrance.
0.7+	21.75	CAUTION: enter Burtons Bridge.
0.25-	22.0-	Cross Fox River.
1.0+	23.0	CAUTION: stoplight at Y-intersection. TURN HARD LEFT onto River Road.
0.6	23.6	View of Griswold Lake to the left.
0.35	23.95	Lilly Lake Road to the right; CONTINUE AHEAD straight.
0.1	24.05	Cross Fox Lake Moraine (Valparaiso Moraine System). Abandoned gravel pits and operating sand and gravel pits can be seen on both sides of the road, in the outwash materials of the Batavia Member of the Henry Formation (Wisconsinan).
0.6	24.65	To the right, Grayslake Peat (Wisconsinan) from one of the swampy areas down below the trees is being removed.
0.45	25.1	TURN RIGHT at the entrance to Moraine Hills State Park.
0.2	25.3	Turn right into the Pike Marsh Parking Area.
		STOP 4. LUNCH AND DISCUSSION OF FOX LAKE END MORAINE FEATURES. (NW 1/4 SW 1/4 NE 1/4 Sec. 7, T. 44N., R. 9 E., 34d P.M.; Wanconda 7.5-minute Quadrangle).
0.1	25.4	Leave Stop 4. STOP: TURN LEFT towards the park entrance.

Miles to next point	Miles to starting point	
0.2	25.6	STOP (1-way): T-road intersection with River Road. TURN RIGHT (north).
0.9	26.5	T-road from left on the curve to the McHenry Dam; CONTINUE AHEAD and BEAR RIGHT (northwesterly) around the curve on River Road.
0.75	27.25	To the left are glimpses of the Fox River.
1.7	28.95	CAUTION: Stoplight; TURN LEFT (westerly) and cross Fox River bridge into McHenry.
0.2-	29.15-	CAUTION: Stoplight; Riverside Drive. CONTINUE AHEAD (northwest).
0.15+	29.3+	CAUTION: Stoplight; Green Street. CONTINUE AHEAD (northwest).
0.1-	29.4-	CAUTION: Stoplight; Richmond Road. BEAR LEFT (southwest) on SR 31.
0.5+	29.45	Cross Boone Creek.
0.25	29.7	CAUTION: Stoplight; Front Street. TURN LEFT (southerly) on SR 31.
1.6	31.3	CAUTION: T-road intersection; turn right (west) on Bull Valley Road.
0.4	31.7	Notice boulder pile to the right on other side of ditch. The itinerary here is across one of the old glacial sluiceways.
0.4	32.1	CAUTION: single railroad track (C&NW). CONTINUE AHEAD (west).
0.6	32.7	STOP (4-way): Crystal Lake-McHenry Road. CONTINUE AHEAD (west), crossing a small, relatively narrow upland spur between these glacial sluiceways.
0.4	33.1	Park along road (as far off the blacktop as is safe) just below crest of ridge.
		STOP 5. DISCUSSION OF GLACIAL SLUICEWAYS AND UNDERFIT STREAMS. (SE 1/4 SW 1/4 SE 1/4 NW 1/4 Sec. 4, T. 44 N., R. 8 E., 3rd P.M.; McHenry 7.5-minute Quadrangle).
0.0	33.1	Leave Stop 5. CONTINUE AHEAD (west).

Miles to next point	Miles to starting point	
1.65	34.75	CAUTION: enter the village of Bull Valley as route ascends Cary Moraine.
0.15+	34.9+	STOP (3-way): Ridge Road. CONTINUE AHEAD (west) on Bull Valley Road. Here the upland of the Cary Moraine has a very hummocky topography. Many residences are being built in this area.
1.0	35.9+	STOP (4-way): crossroad (Valley Hill Road). CONTINUE AHEAD (west) and prepare to descend steep hill into a glacial sluiceway now occupied by Boone Creek.
0.4	36.3-	Cross Boone Creek.
0.35+	36.65+	TURN RIGHT (north) at the school.
0.1+	36.75+	STOP (3-way): T-road intersection. BEAR RIGHT (northeasterly) on Cold Springs Road. Park along edge of Cold Springs Road.
0.4+	37.2-	STOP 6. TO THE RIGHT IN THE BOTTOMLAND IS A RIDGE, PARTLY EXCAVATED ON THE NORTH SIDE, THAT APPEARS TO BE A PORTION OF AN ESKER. TO THE LEFT ACROSS THE ROAD IS A SURVEY MARKER WITNESS SIGN AND TO THE LEFT OF IT ON THE SOUTH SIDE OF THE FENCE CORNER IS A U.S. GEOLOGICAL SURVEY BENCHMARK. (NW 1/4 NE 1/4 NE 1/4 NE 1/4 Sec. 2, T. 44 N., R. 7 E., 3rd P.M.; Woodstock 7.5-minute Quadrangle).
0.0	37.2-	Leave Stop 6. CONTINUE AHEAD (northeasterly).
0.2+	37.4+	To the right is part of the abandoned gravel pit in the bottomlands.
0.25	37.65	CAUTION: rough road.
0.7+	38.35+	STOP (1-way): T-road intersection. TURN RIGHT (northeasterly) on Thompson Road.
0.3	38.65+	CURVE LEFT (north) on Thompson Road.
0.5	39.15+	STOP: crossroads; Cross traffic on SR 120 does NOT stop. CONTINUE AHEAD (north) on Thompson Road. Note the very hummocky topography on both sides of the road here. Park along side of Thompson Road. CAUTION: fast traffic.

Miles to next point	Miles to starting point	
1.05-	40.2	STOP 7. VIEW OF A SMALL PORTION OF WONDER LAKE AND BEYOND IT THE TOWN OF WONDER LAKE ON THE CARY MORAINE. (NE/c SE 1/4 SE 1/4 NW 1/4 NW 1/4 Sec. 24, T. 45 N., R. 7 E., 3rd P.M.; McHenry 7.5-minute Quadrangle).
0.0	40.2	Leave Stop 7. CONTINUE AHEAD (north).
0.3	40.5	Enter village of Sunrise Ridge.
0.35-	40.85-	STOP (4-way): Sunset Drive. CONTINUE AHEAD (north) on Thompson Road.
0.5+	41.35	STOP (3-way): Wondermere Road. BEAR RIGHT slightly (northeast) and cross Nippersink Creek.
0.55	41.9	STOP (1-way): TURN RIGHT (east) on Wonder Lake Road.
0.35	42.25	To the right are occasional glimpses of Wonder Lake.
0.05	42.3	CAUTION: TURN LEFT (northerly) and cross a creek; road is very rough.
1.3-	43.6-	STOP (1-way): TURN RIGHT (east) on Howe Road.
0.95	44.55-	CAUTION: Y-intersection on blacktop. BEAR LEFT (northwesterly) past the Old Mill Inn on Barnard Mill Road. <u>DO</u> <u>NOT</u> cross Nippersink Creek.
0.3	44.85-	CAUTION: Y-intersection. BEAR RIGHT (north-easterly) on Keystone Road.
0.4+	45.25	Park along road shoulder.
		STOP 8. VIEW EAST-SOUTHEAST TOWARD GLACIAL PARK (McHENRY COUNTY CONSERVATION DISTRICT). ONE OF THE LARGEST KAMES IN THE COUNTY CAN BE SEEN ACROSS NIPPERSINK CREEK. (Near SW/c SE 1/4 SE 1/4 SW 1/4 NE 1/4 Sec. 31, T. 46 N., R. 8 E., 3rd P.M.; Richmond 7.5-minute Quadrangle).
0.0	45.25	Leave Stop 8. CONTINUE AHEAD (east and then north) on Keystone Road.

Miles to next point	Miles to starting point	
0.3	45.55	To the right is a delta kame (Batavia Member) that is largely sand. Part of the sod cover was destroyed, and the wind was able to produce a blow-out on the north side.
0.25	45.8	To the right, in the distance, is another large delta kame.
0.7	46.5	Park along the edge of the road. CAUTION: visibility is somewhat limited to and from the north.

STOP 9. DISCUSSION OF NIPPERSINK VALLEY AND COLLECTING SITE AT ABANDONED GRAVEL PIT ON THE WEST SIDE OF THE ROAD. You MUST have permission to enter this property (the second house south on the west side of Keystone Road). (NE 1/4 NE 1/4 SE 1/4 NE 1/4 Sec. 30, T. 46 N., R. 8 E., 3rd P.M.; Richmond 7.5-minute Quadrangle).

END OF FIELD TRIP

NOTE: Continue ahead 0.35 miles to crossroads—Tyron Grove Road. THEN: continue ahead (north) for approximately 2.3 miles to SR 173; turn east to Richmond or west to Hebron. Turn east on Tyron Grove Road approximately 1.65 miles to SR 31 and US 12 junction 1.25 miles south of Richmond.

NOTE: Continue ahead 0.35 miles to crossroads—Tyron Grove Road. THEN:

1. Continue ahead (north) for approximately 2.3 miles to SR 173; turn east to Richmond or west to Hebron.

2. Turn east on Tyron Grove Road approximately 1.65 miles to SR 31 and US 12 junction 1.25 miles south of Richmond.

3. SR 47 between Hebron and Woodstock is approximately 6 miles to the west.

ILLINOIS STATE GEOLOGICAL SURVEY

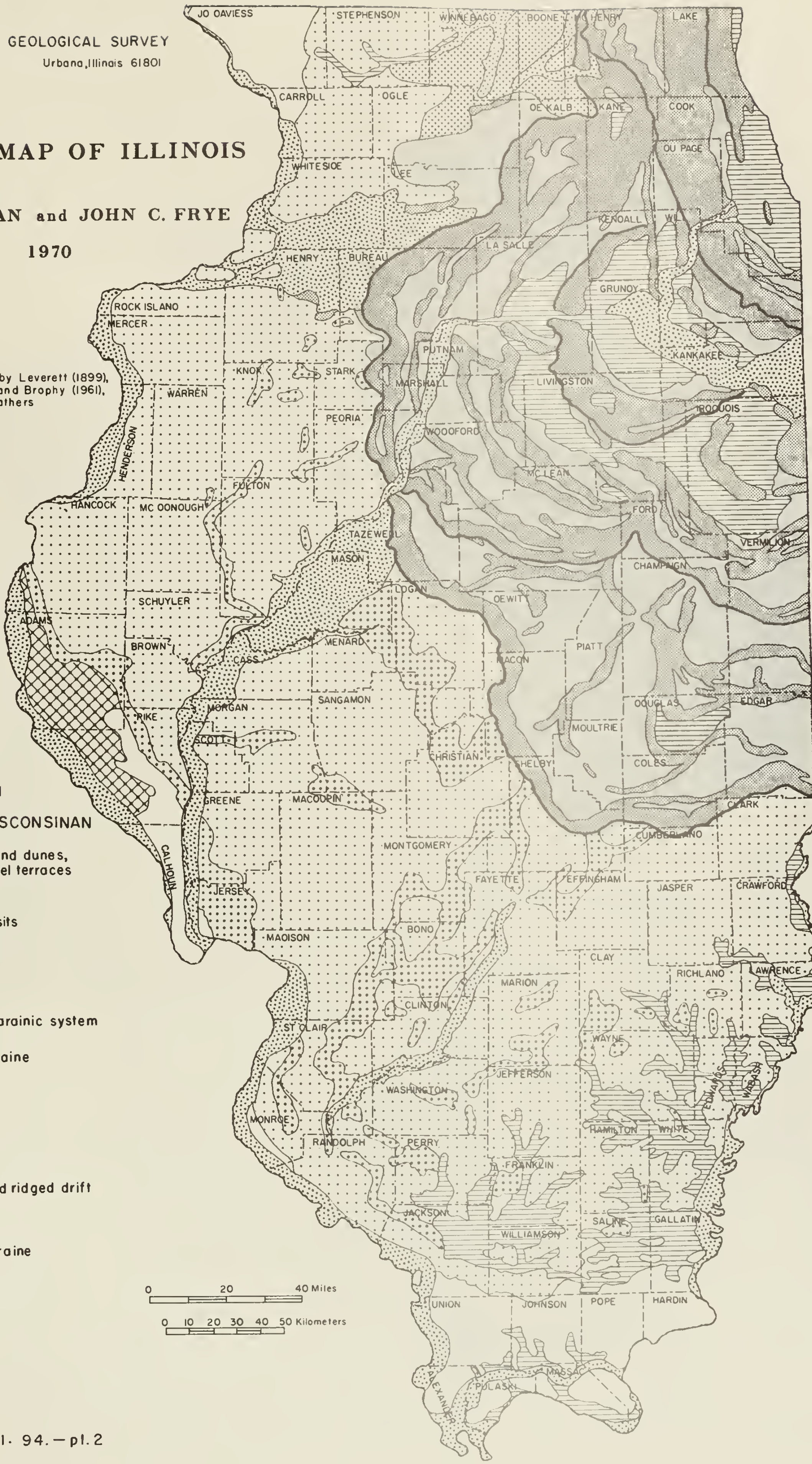
John C. Frye, Chief   Urbana, Illinois 61801

GLACIAL MAP OF ILLINOIS

H.B. WILLMAN and JOHN C. FRYE

1970

Modified from maps by Leverett (1899), Ekblaw (1959), Leighton and Brophy (1961), Willman et al. (1967), and others



EXPLANATION

HOLOCENE AND WISCONSINAN

Alluvium, sand dunes, and gravel terraces

WISCONSINAN

Lake deposits

WOODFORDIAN

Moraine

Front of morainic system

Groundmoraine

ALTONIAN

Till plain

ILLINOIAN

Moraine and ridged drift

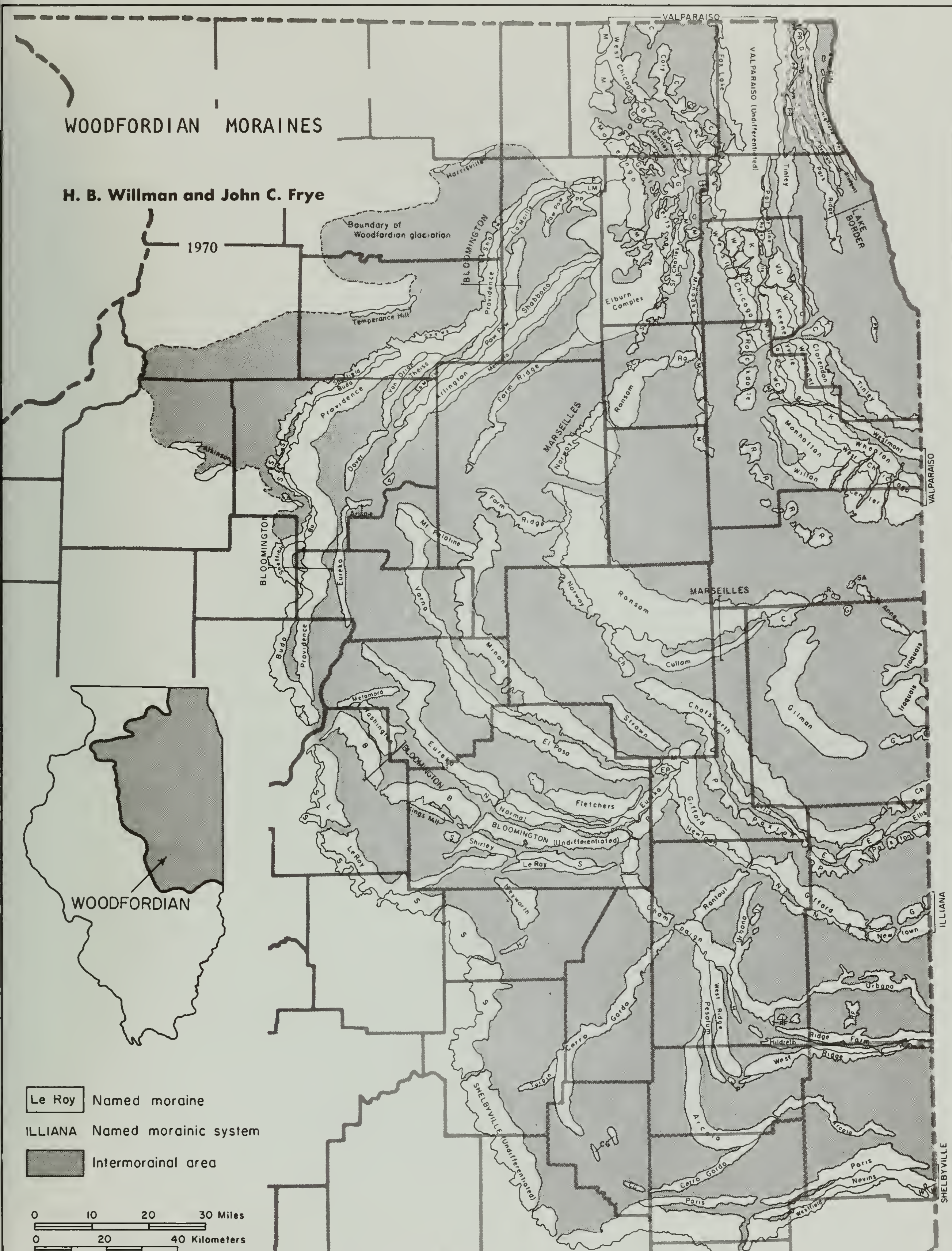
Groundmoraine

KANSAN

Till plain

DRIFTLESS

Modified from Bull. 94. — pl. 2

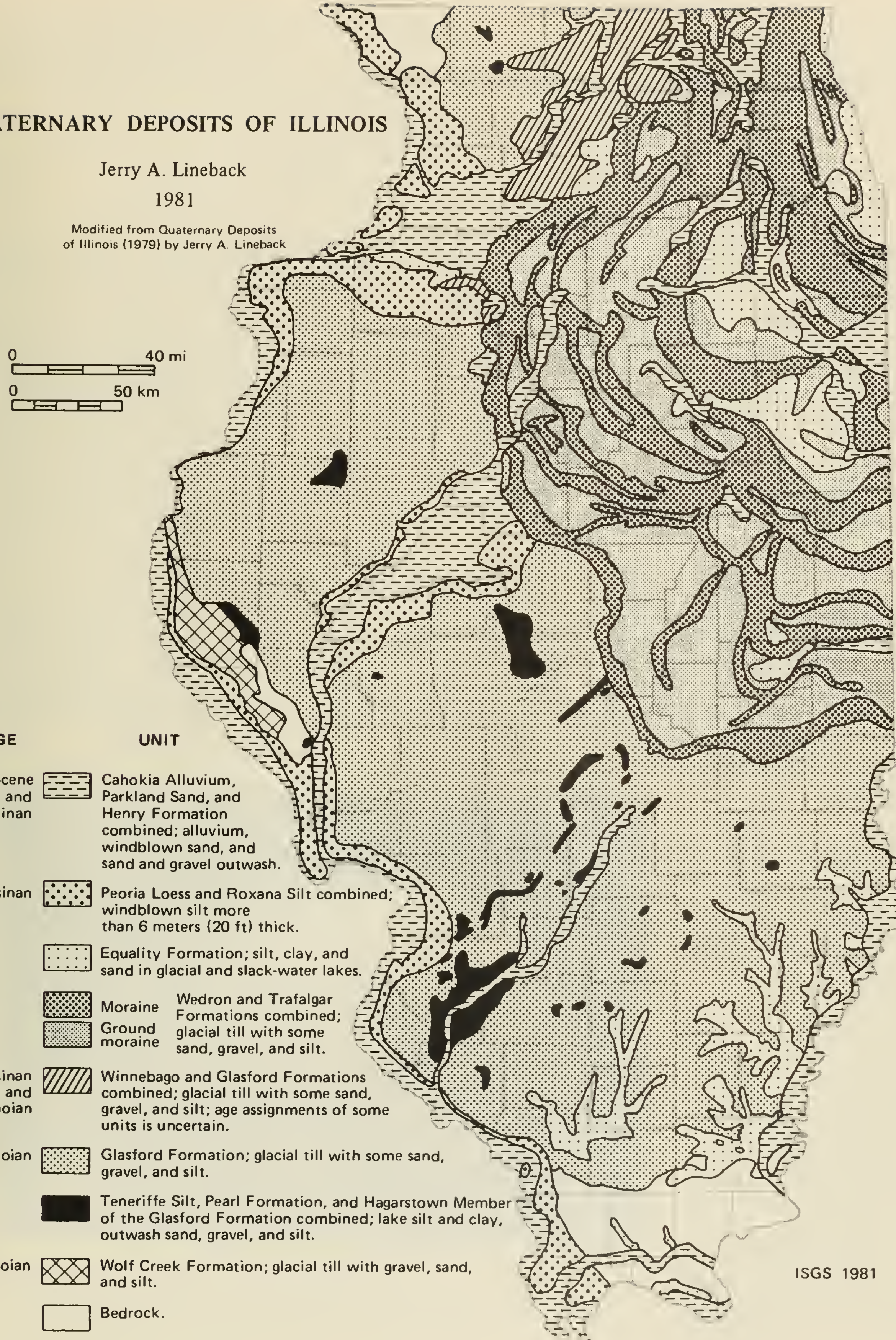

WOODFORDIAN MORAINES
H. B. Willman and John C. Frye
1970
Boundary of Woodfordian glaciation
VALPARAISO
VALPARAISO (Undifferentiated)
BLOOMINGTON
BLOOMINGTON (Undifferentiated)
MARSEILLES
LAKE BORDER
ILLIANA
SHELBYVILLE
SHELBYVILLE (Undifferentiated)
Harrisville
Temperance Hill
Atkinson
Elburn Complex
West Chicago
Cary
Fox Lake
Tinley
Park Ridge
Highland Park
Shabbona
Providence
Paw Paw
Farm Ridge
Arlington
Van Orin
Theiss
Dover
Eureka
Budo
Sheffield
Ransom
Norway
Minonk
Varna
Mt Palatine
Cullom
Chatsworth
Strawn
Gilman
Iroquois
El Paso
Fletchers
Normal
Metamora
Washington
Kings Mill
Shirley
Le Roy
Heyworth
Gifford
Paxton
Newtown
Rantoul
Urbana
West Ridge
Pesotum
Hildreth
Cerro Gordo
Turpin
Arcola
Paris
Nevins
Westfield
Manhattan
Wilton
Westmont
Wheaton
Keeneyville
Clarendon
Rockdale
Minooka
St Charles
Marengo
Huntley
Le Roy Named moraine
ILLIANA Named morainic system
Intermorainal area
0 10 20 30 Miles
0 20 40 Kilometers
WOODFORDIAN

QUATERNARY DEPOSITS OF ILLINOIS

Jerry A. Lineback

1981

Modified from Quaternary Deposits of Illinois (1979) by Jerry A. Lineback



AGE	UNIT
Holocene and Wisconsinan	Cahokia Alluvium, Parkland Sand, and Henry Formation combined; alluvium, windblown sand, and sand and gravel outwash.
Wisconsinan	Peoria Loess and Roxana Silt combined; windblown silt more than 6 meters (20 ft) thick.
	Equality Formation; silt, clay, and sand in glacial and slack-water lakes.
	Moraine / Ground moraine — Wedron and Trafalgar Formations combined; glacial till with some sand, gravel, and silt.
Wisconsinan and Illinoian	Winnebago and Glasford Formations combined; glacial till with some sand, gravel, and silt; age assignments of some units is uncertain.
Illinoian	Glasford Formation; glacial till with some sand, gravel, and silt.
	Teneriffe Silt, Pearl Formation, and Hagarstown Member of the Glasford Formation combined; lake silt and clay, outwash sand, gravel, and silt.
Pre-Illinoian	Wolf Creek Formation; glacial till with gravel, sand, and silt.
	Bedrock.

ISGS 1981

ILLINOIS STATE GEOLOGICAL SURVEY
Urbana, Illinois 61801

GEOGRAM 2
October 1974

ERRATICS ARE ERRATIC

Myrna M. Killey

You may have seen them scattered here and there in Illinois—boulders, some large, some small, lying alone or with a few companions in the corner of a field, at the edge of a road, in someone's yard, or perhaps on a courthouse lawn or schoolyard. Many of them seem out of place, like rough, alien monuments in the stoneless, grassy knolls and prairies of our state. Some—the colorful and glittering granites, banded gneisses, and other intricately veined and streaked igneous and metamorphic rocks—are indeed foreign rocks, for they came from Canada and the states north of us. Others—gray and tan sedimentary rocks—are native rocks and may be no more than a few miles from their place of origin. All of these rocks are glacial boulders that were moved to their present sites by massive ice sheets that flowed across our state. If these boulders are unlike the rocks in the quarries and outcrops in the region where they are found, they are called erratics.

The continental glaciers of the Great Ice Age scoured and scraped the land surface as they advanced, pushing up chunks of bedrock and grinding them against each other or along the ground surface as the rock-laden ice sheets pushed southward. Hundreds of miles of such grinding, even on such hard rocks as granite, eventually rounded off the sharp edges of these passengers in the ice until they became the rounded, irregular boulders we see today. Although we do not know the precise manner in which erratics reached their present isolated sites, many were probably dropped directly from the melting front of a glacier. Others may have been rafted to their present resting places by icebergs on ancient lakes or on the floodwaters of some long-vanished stream as it poured from a glacier. Still others, buried in the glacial deposits, could have worked their way up to the land surface as the surrounding loose soil repeatedly froze and thawed. When the freezing ground expands, pieces of rock tend to be pushed upward, where they are more easily reached by the farmer's plow and also more likely to be exposed by erosion.

An eight-foot boulder of pink granite left by a glacier in the bed of a creek about 5 miles southwest of Alexis, Warren County, Illinois. (From ISGS Bulletin 57, 1929.)

Generally speaking, erratics found northeast of a line drawn from Freeport in Stephenson County, southward through Peoria, and then southeastward through Shelbyville to Marshall at the east edge of the state were brought in by the last glacier to enter Illinois. This glaciation, called the Wisconsinan, spread southwestward into Illinois from a center in eastern Canada, reaching our state about 75,000 years ago and (after repeated advances and retreats of the ice margin) melting from the state about 12,500 years ago. Erratics to the west or south of the great arc outlined above were brought in by a much older glacier, the Illinoian, which spread over most of the state about 300,000 to 175,000 years ago. Some erratics were brought in by even older glaciers that came from the northwest.

You may be able to locate some erratics in your neighborhood. Sometimes it is possible to tell where the rock originally came from by determining the kind of rock it is. A large boulder of granite, gneiss, or other igneous or metamorphic rock may have come from the Canadian Shield, a vast area in central and eastern Canada where rocks of Precambrian age (more than 600 million years old) are exposed at the surface. Some erratics containing flecks of copper were probably transported here from the "Copper Range" of the upper peninsula of Michigan. Large pieces of copper have been found in glacial deposits of central and northern Illinois. Light gray to white quartzite boulders with beautiful, rounded pebbles of red jasper came from a very small outcrop area near Bruce Mines, Ontario, Canada. Purplish pieces of quartzite, some of them banded, probably originated in the Baraboo Range of central Wisconsin. Most interesting of all are the few large boulders of Canadian tillite. Tillite is lithified (hardened into rock) glacial till deposited by a Precambrian glacier many millions of years older than the ones that invaded our state a mere few thousand years ago. Glacial till is an unsorted and unlayered mixture of clay, sand, gravel, and boulders that vary widely in size and shape. Tillite is a gray to greenish gray rock containing a mixture of grains of different sizes and scattered pebbles of various types and sizes.

Many erratics are of notable size and beauty, and in parts of Illinois they are commonly used in landscaping. Some are used as monuments in courthouse squares, in parks, or along highways. Many are marked with metal plaques to indicate an interesting historical spot or event. Keep an eye out for erratics. There may be some of these glacial strangers in your neighborhood that would be interesting to know.

ILLINOIS STATE GEOLOGICAL SURVEY GEOGRAM 5
Urbana, Illinois 61801 October 1975

ANCIENT DUST STORMS IN ILLINOIS

Myrna M. Killey

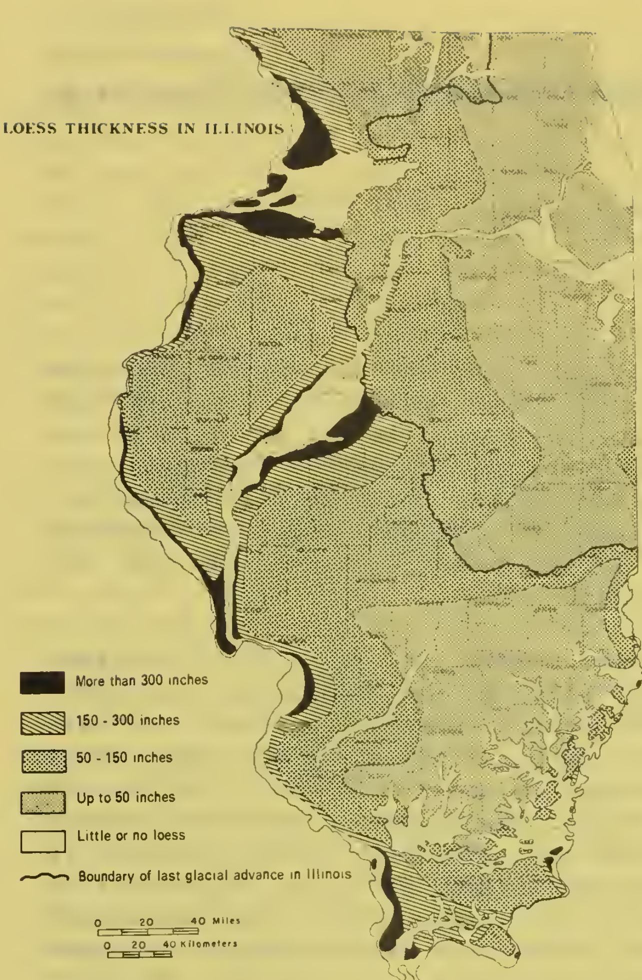
Fierce dust storms whirled across Illinois long before human beings were here to record them. Where did all the dust come from? Geologists have carefully put together clues from the earth itself to get the story. As the glaciers of the Great Ice Age scraped and scoured their way southward across the landscape from Canada, they moved colossal amounts of rock and earth. Much of the rock ground from the surface was kneaded into the ice and carried along, often for hundreds of miles. The glaciers acted as giant grist mills, grinding much of the rock and earth to "flour"—very fine dust-sized particles.

During the warm seasons, water from the melting ice poured from the glacier front, laden with this rock flour, called silt. In the cold months the meltwater stopped flowing and the silt was left along the channels the water had followed, where it dried out and became dust. Strong winds picked up the dust, swept it from the floodplains, and carried it to adjacent uplands. There the forests along the river valleys trapped the dust, which became part of the moist forest soil. With each storm more material accumulated until the high bluffs adjacent to major rivers were formed. The dust deposits are thicker along the eastern sides of the valleys than they are on the western sides, a fact from which geologists deduce that the prevailing winds of that time blew from west to east, the same direction as those of today. From such clues geologists conclude that the geologic processes of the past were much like those of today.

The deposits of windblown silt are called loess (rhymes with "bus"). Loess is found not only in the areas once covered by the glaciers but has been blown into the nonglaciated areas. The glaciers, therefore, influenced the present land surface well beyond the line of their farthest advance.

Loess has several interesting characteristics. Its texture is so fine and uniform that it can easily be identified in roadcuts—and because it blankets such a vast area many roads are cut through it. Even more noticeable is its tendency to stand in vertical walls. These steep walls develop as the loess drains and becomes tough, compact, and massive, much like a rock. Sometimes cracks develop in the loess, just as they do in massive limestones and sandstones. Loess makes good highway banks if it is cut vertically. A vertical cut permits maximum drainage because little surface is exposed to rain, and rainwater tends to drain straight down through it to the rock underneath. If the bank is cut at an angle more water soaks in, which causes the loess to slump down. Along Illinois roads the difference between a loess roadcut and one in ordinary glacial till is obvious. The loess has a very uniform texture, while the till is composed of a random mixture of rock debris, from clay and silt through cobbles and boulders.

Many loess deposits are worth a close look. Through a 10-power hand lens separate grains can be seen, among them many clear, glassy, quartz grains. Some loess deposits contain numerous rounded, lumpy stones called concretions. Their formation began when water percolating through the loess dissolved tiny

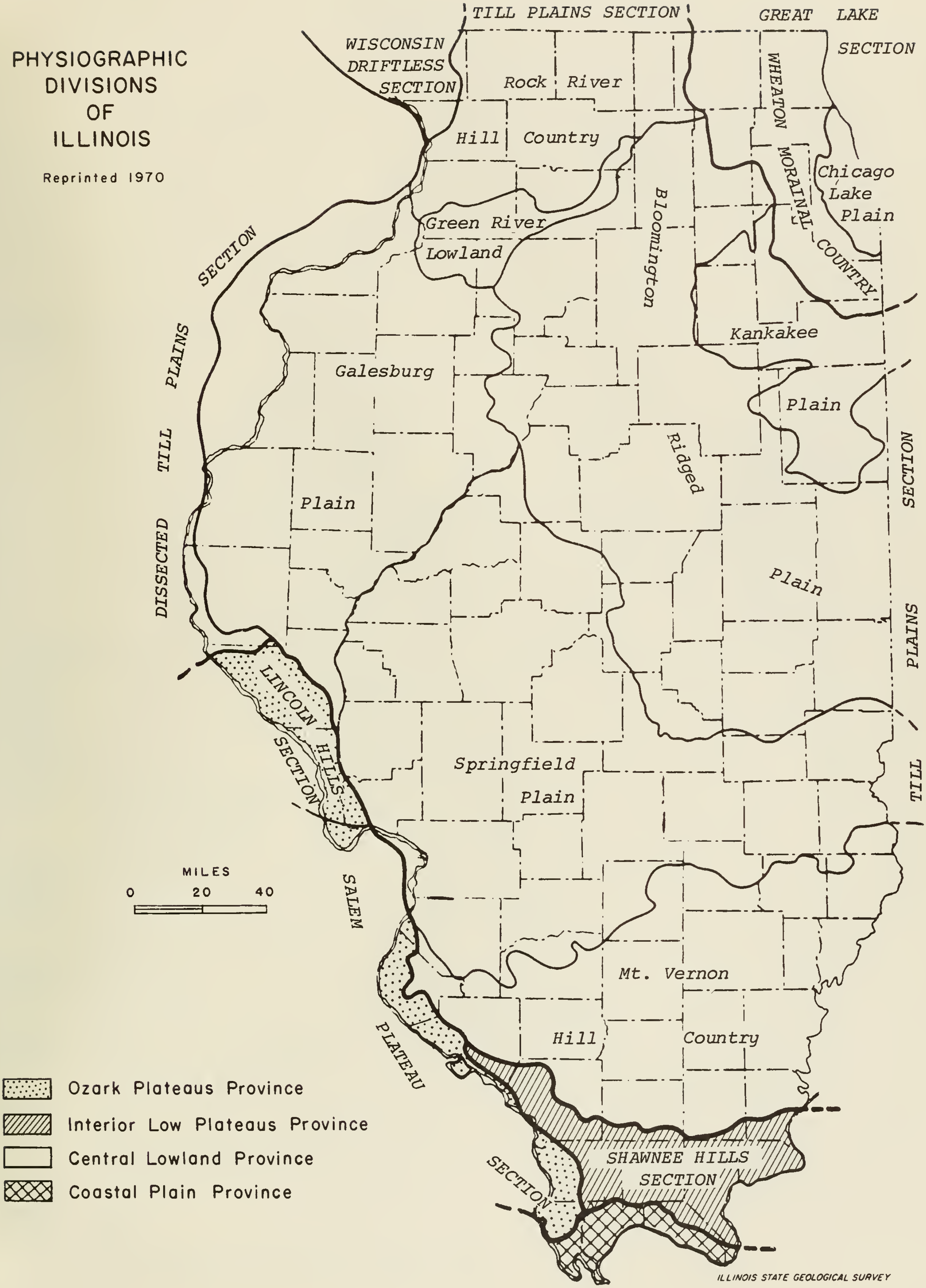


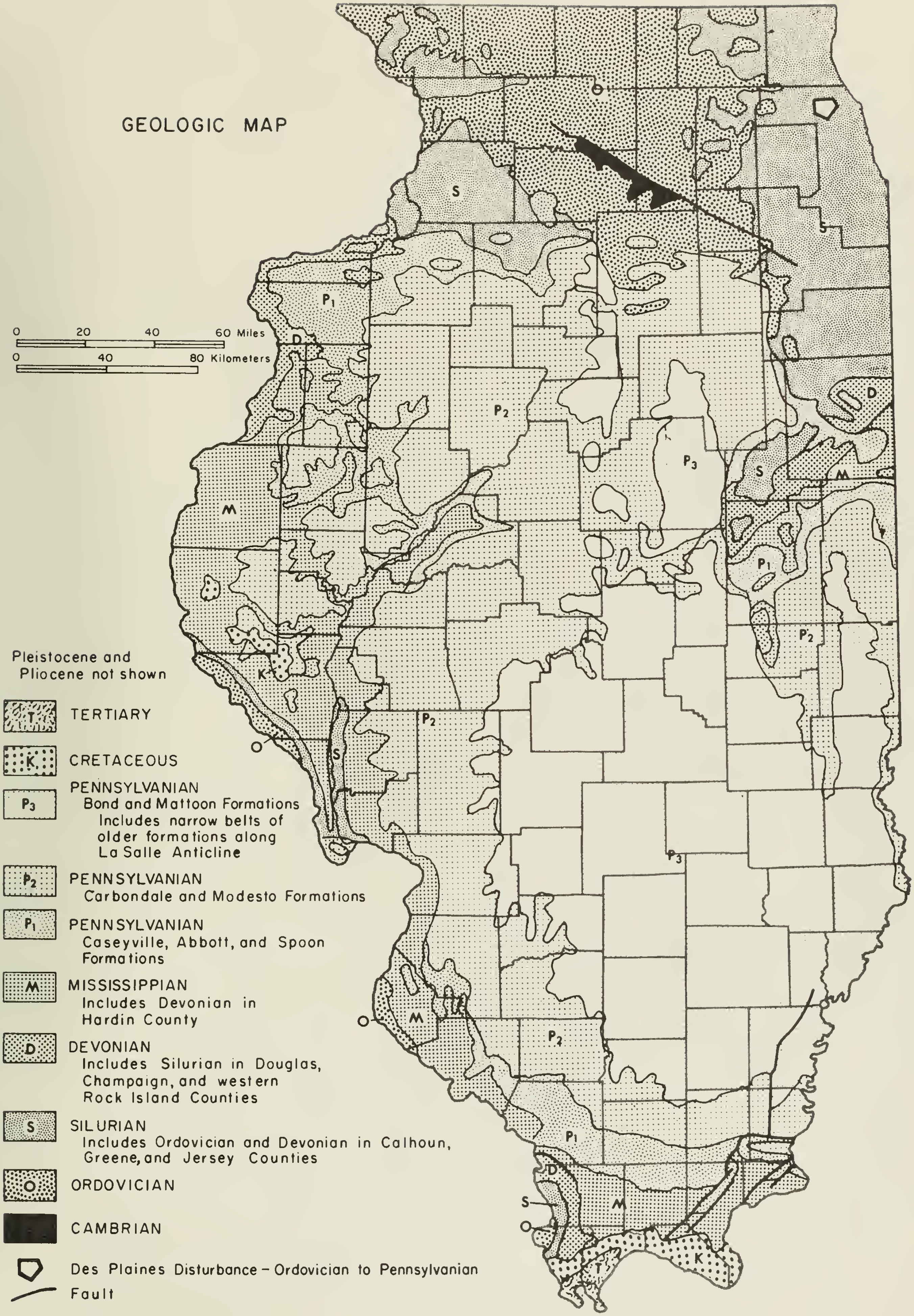
limestone grains. Some of the dissolved minerals later became solid again, gathering around a tiny nucleus or along roots to form the lumpy masses. A few such concretions are shaped roughly like small dolls and, from this resemblance, are called "loess kindchen," a German term meaning "loess children." They may be partly hollow and contain smaller lumps that make them rattle when shaken.

Fossil snails can be found in some loess deposits. The snails lived on the river bluffs while the loess was being deposited and were buried by the dust. When they are abundant, they are used to determine how old the loess is. The age is found by measuring the amount of radioactive carbon in the calcium carbonate of their shells.

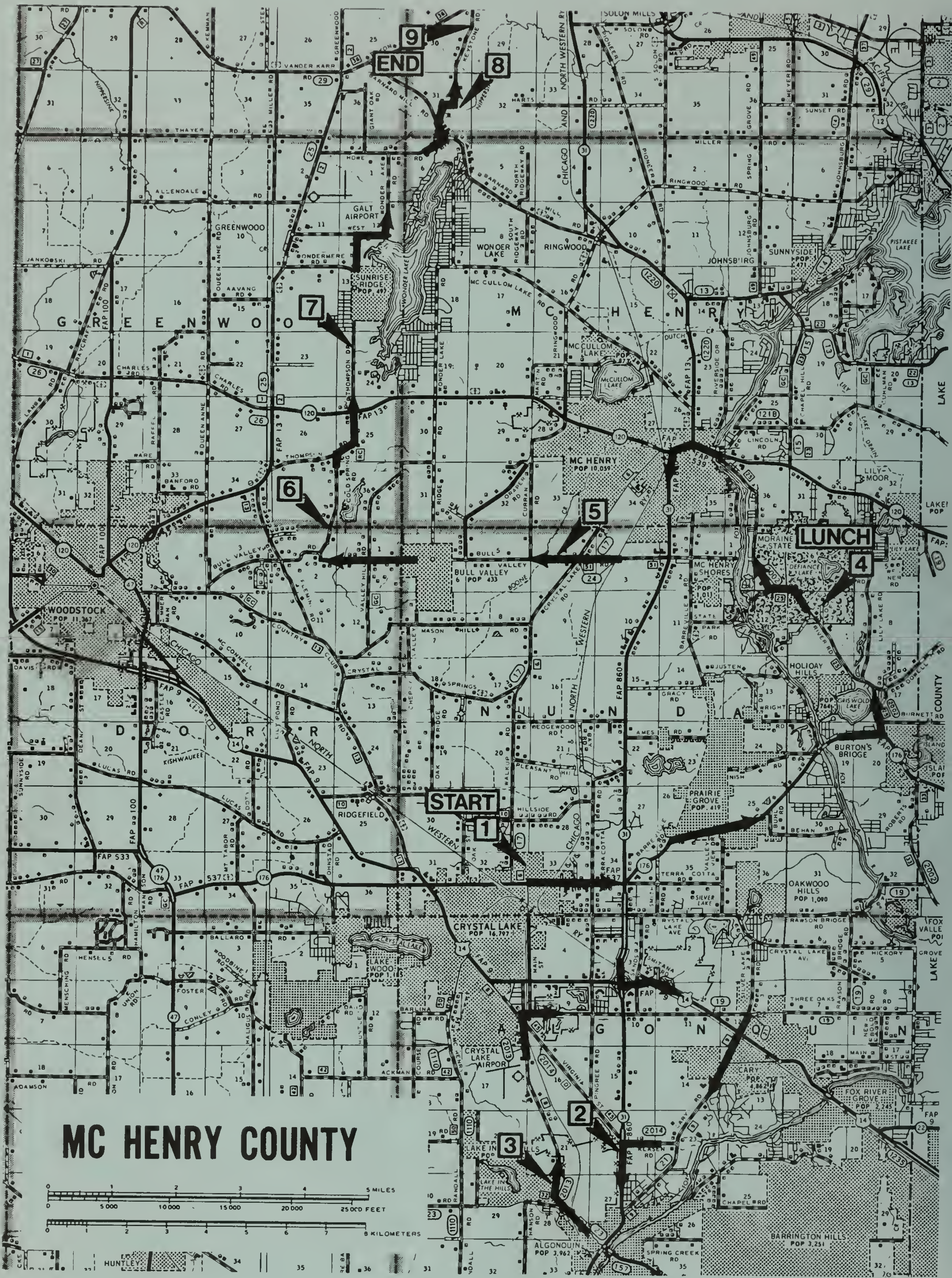
Some of the early loess deposits were covered by new layers of loess following later glacial invasions. Many thousands of years passed between the major glacial periods, during which time the climate was as warm as that of today. During the warm intervals, the surface of the loess and other glacial deposits was exposed to weather. Soils developed on most of the terrain, altering the composition, color, and texture of the glacial material. During later advances of the ice, some of these soils were destroyed, but in many places they are preserved under the younger sediments. Such ancient buried soils can be used to determine when the materials above and below them were laid down by the ice and what changes in climate took place.

The blanket of loess deposited by the ancient dust storms forms the parent material of the rich, deep soils that today are basic to the state's agriculture. A soil made of loess crumbles easily and has great moisture-holding capacity. It also is free from rocks that might complicate cultivation. Those great dust storms that swirled over the land many thousands of years ago thus endowed Illinois with one of its greatest resources, its highly productive soil.


PHYSIOGRAPHIC DIVISIONS OF ILLINOIS
Reprinted 1970
TILL PLAINS SECTION
GREAT LAKE SECTION
WISCONSIN DRIFTLESS SECTION
Rock River Hill Country
WHEATON MORAINAL COUNTRY
Chicago Lake Plain
Green River Lowland
Bloomington Ridged Plain
Kankakee Plain
Galesburg Plain
DISSECTED TILL PLAINS SECTION
TILL PLAINS SECTION
LINCOLN HILLS SECTION
Springfield Plain
SALEM PLATEAU SECTION
Mt. Vernon Hill Country
SHAWNEE HILLS SECTION
MILES
0 20 40
Ozark Plateaus Province
Interior Low Plateaus Province
Central Lowland Province
Coastal Plain Province
ILLINOIS STATE GEOLOGICAL SURVEY



GEOLOGIC MAP
0 20 40 60 Miles
0 40 80 Kilometers
Pleistocene and Pliocene not shown
TERTIARY
CRETACEOUS
PENNSYLVANIAN
Bond and Mattoon Formations
Includes narrow belts of older formations along La Salle Anticline
PENNSYLVANIAN
Carbondale and Modesto Formations
PENNSYLVANIAN
Caseyville, Abbott, and Spoon Formations
MISSISSIPPIAN
Includes Devonian in Hardin County
DEVONIAN
Includes Silurian in Douglas, Champaign, and western Rock Island Counties
SILURIAN
Includes Ordovician and Devonian in Calhoun, Greene, and Jersey Counties
ORDOVICIAN
CAMBRIAN
Des Plaines Disturbance – Ordovician to Pennsylvanian
Fault


MC HENRY COUNTY
START
1
2
3
4
LUNCH
5
6
7
8
9
END
WOODSTOCK POP 11,362
MC HENRY POP 10,059
CRYSTAL LAKE POP 16,797
BULL VALLEY POP 433
RINGWOOD
JOHNSBURG
SUNNYSIDE
WONDER LAKE
MC CULLOM LAKE
GREENWOOD
RIDGEFIELD
PRAIRIE GROVE
OAKWOOD HILLS POP 1,090
CARY
FOX RIVER GROVE POP 2,245
ALGONQUIN POP 3,962
BARRINGTON HILLS POP 3,251
LAKE IN THE HILLS
HOLIDAY HILLS
BURTON'S BRIDGE
MORAINE STATE
MC HENRY SHORES
SUNRISE RIDGE POP 497
GALT AIRPORT
CRYSTAL LAKE AIRPORT
SOLON MILLS
HUNTLEY
G R E E N W O O
M C H E N R Y
N U N D A
D O R R
A L G O N Q U I N
5 MILES
25 000 FEET
8 KILOMETERS